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ABSTRACT

High School students with scores in the upper and lower quartiles of the first half of the Hidden Figures Test took the second half of the test in pairs in which one member was drawn from the highest, the other from the lowest quartile. For 14 pairs the "high" member was female; in 14 pairs the "high" member was male. In the social situation "high" males lowered their levels of performance only slightly whereas there was a highly significant tendency for girls to depress their performance. In half the dyads in which the girl was from the "high" quartile she actually performed more poorly than the "low" boy. Such a reversal occurred in only one of the fourteen pairs with an initially "high" male. Presence or absence of behavioral avoidance of success was not paralleled in fantasy, as shown in protocols on Horner's projective test. A higher proportion of boys than girls told stories in which success led to unhappy consequences. The results are attributed to current mores among adolescents of both sexes. (Author)

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Behavioral and Fantasied Indicators of Avoidance of Success in Men and Women[1]

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Although achievement drives have been studied for many years, there has been relatively little rigorous examination of the phenomenon of ambivalence about success which is so evident among the young. The primary exceptions have been the work of Horner (1968, 1969) and parallel studies by Alper (1971) on the fear of success among women. Horner posited a "motive to avoid success" in explanation of the fact that the lawful relations between n Achievement and other behavior among men cannot be replicated among women.

Fear of success was inferred by Horner from the stories given by female undergraduates at the University of Michigan in response to a TAT-like verbal cue which described a successful woman.

The purpose of the current study was to explore the possibility that behavioral evidence of avoidance of success might be found even if the motive were not expressed in fantasy. The study was designed to determine the degree to which girls would hold back from outperforming boys in dyadic settings even in tasks at which the girls were clearly superior in ability to the boys.

The task chosen for the study was the Hidden Figures Test, a measure of

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field dependency recommended by the Educational Testing Service for grades 6-16. If avoidance of success is a strong motive for young women, female subjects with high scores on a portion of the test should lower their performance markedly when they are asked to complete the test along with a male partner whose original level of performance was low. Such decreases should rarely occur for originally "high" males. If the subjects were also given Horner's stems, the relation between behavioral and fantasied avoidance of success could easily be determined.

Procedure:

Our sample consisted of 203 students recruited from regular (i. e., not honors) chemistry classes in a predominantly white, middle-class suburban Philadelphia high school. In the initial experimental session, the first half of the Hidden Figures Test was administered to the students. They also responded by writing stories to Horner's cues describing a woman or man successful in medical school.

When the Hidden Figures Tests were scored, those students who fell in the first and last quartiles were defined as potential subjects for the second part of the experiment. The subjects scoring in the first quartile will subsequently be referred to as high males and high females, while those scoring in the last quartile will be designated low males and low females. This procedure resulted in a pool of 103 potential subjects.

During the experimental manipulation proper, subjects were matched in male-female pairs of unequal ability. That is, high males were paired with low females and high females with low males. This resulted in two conditions, one in which the boy was the more competent partner and the other in which the female member was superior.

As the subjects arrived for this second session, the pairs were seated together facing the experimenter. The members of the pair were given different colored pens so that it was possible to identify each partner's work in scoring the test. The second half of the Hidden Figures Test was then administered using standard cooperative instructions.

As the subjects worked on the test, an observer recorded the number of suggestions made, the number of disagreements, and the number of times each subject showed some form of tension release such as giggling, laughter, joking about the task, or negative comments to the experimenter about performance ("I can't do this kind of thing"). Afterwards, the subjects were asked to complete a brief questionnaire dealing with their socio-economic status, academic standing, aspirations, and feelings about the experiment.

The Hidden Figures Tests were then scored to determine how many problems each individual had solved in the team task. For each dyad the score obtained in the team task by the low partner was subtracted from the team score of the high partner resulting in what we've called a "difference score" for each team. A positive difference score would indicate superior performance by the originally high partner, while a negative difference score would indicate superior performance by the originally low member.

Results:

In terms of results, the first comparison reported will be between difference scores obtained in the two experimental conditions: that in which females were superior to males and that in which males were superior to females. In the high male-low female condition only one of the dyads had a negative difference score, whereas in the high female-low male condition, half of the 14 dyads had negative difference scores (Fisher exact probability test significant

at the .025 level). The mean difference score of the high male-low female group ($\bar{X}$ = 2.9, s = 2.4) was significantly higher than that of the high female-low male group ($\bar{X}$ = -0.2, s = 3.3; t = 2.90, p <.01). That is, in the pairs in which the boy was originally high, he continued to outperform his female partner. Where the girl was high, the relative position of the two members of the pair reversed fifty percent of the time.

In order to determine the nature of the changes which led to these reversals, subjects were treated as their own controls and their scores on the pretest were compared with those from the experimental session. Table 1 indicates that as a group the high girls fell markedly in performance, the high boys fell somewhat less; the low girls remained constant, but the low boys improved.

In statistical comparisons of change from pretest to experimental situations, a measure of relative change is more valid than absolute difference scores. To obtain such a measure for the Hidden Figures Test in this study, a regression line was plotted with scores from the dyadic setting as the y variable and the pretest scores as the x variable. A regressed score ($y - y'$) was then calculated for each subject. Regressed scores are negative for subjects whose performance during interaction was lower than that predicted by the regression line, positive for subjects whose performance during interaction was higher than predicted. The regressed scores permit a comparison essentially equivalent to an analysis of covariance with the pretest scores as covariate.

As a whole males showed significantly higher regressed scores than females (see Tables 1 and 2). There was no significant relation between change in the Hidden Figures Test scores and field dependency, as defined by the column effect, i. e. classification as "high" or "low" on the basis of the

pretest, nor was there a significant interaction effect.

The next step was to examine the available data concerning individual characteristics of the members of the 14 high female-low male dyads in an attempt to differentiate the seven pairs in which a reversal of scores occurred (the low male surpassed the high female) from those in which there was no reversal. This treatment was based on the assumption (supported by the experimenter's observations of the interactions) that the members of the pair were highly sensitive to each other's level of performance.

None of the available measures differentiated the low boys who rose above their originally high female partners from those who did not. Only two factors differentiated girls who reversed from those who did not. The first factor was parental educational level. Of the seven high girls who were surpassed by their low male partner, only one had a father with any training beyond college. In contrast, of the seven high girls who scored above their low male partners in the team task, six had fathers who had attended graduate or professional school (Fisher exact probability test significant at the .025 level). The mothers of these girls were correspondingly better-educated, although the difference was not significant. It is, of course, difficult to know precisely what a variable such as this is getting at, since it is necessarily confounded by such factors as social class differences.

The other difference between the females in these groups was in the number of tension-release responses scored during testing. The mean number of tension-releasing responses per subject was 1.2; the median was 1. Of the 56 subjects, 27 gave no evidence of tension release. Thus, the subjects who showed more than one instance of tension release were classified as above the mean, those with one or none as below. Of the seven high girls who retained their superior

position, five ranked above the mean on tension release, whereas only one of the seven girls who dropped below the low male partner showed more than average tension-releasing behavior. The difference is almost but not quite significant (Fisher exact probability slightly greater than .05). There was little difference in the frequency of imagery dealing with fear of success. Three of the seven girls who fell below their male partners showed fear of success on Horner's test; one of the high girls who remained above her low male partner evidenced this kind of imagery.

The fantasy measure employed in the study provided somewhat questionable results. An examination of the stories written in response to Horner's verbal cues produced data quite different from that obtained by Horner and Alper. The first cue, dealing with two high school seniors who had applied to the same college, elicited virtually no achievement imagery from any of the 200 students tested. The second cue, concerning a successful medical student, elicited imagery which, following Horner's criteria, gave evidence of fear of success. However, both among the entire group of pretest subjects as well as in the smaller group from which the experimental subjects were drawn, boys showed fear of success more frequently than girls.

Conclusion:

The apparent inconsistency between the projective and behavioral data may reflect the differences between an instrument which taps ideology and a set of cues which elicits learned sex-role behavior. This proposition is supported by the fact that the cue dealing with achievement in medical school is none too subtle, and is probably inappropriate for tapping anything other than prevailing, socially desirable ideology concerning achievement. There are additional problems with this particular cue--it may, for example, be confounded by

social class or subject interest variables. Despite these difficulties, however, the projective data do illustrate phenomena well known to those who have had recent contact with middle-class high school students, i. e. the presence of a deep sense of disquiet about the conventional goals of the "Establishment." This is evident in the frequency with which success in medical school is seen as an augury of unhappy consequences ranging from social ostracism to emotional breakdown. A number of the subjects also reflected the pressures of parents towards achievement; the heroes of their stories may have been top of their class, but this triumph fulfilled their parents' needs rather than their own. Clearly, Horner's motive to avoid success is not restricted to women.

Indeed, since most of the stories told by the girls resembled those told by boys, even repeating many of the same themes, they probably indicate a generalized rejection of establishment goals rather than the specific problems of being female. Thus, although these cues did not seem to pick up fear of success in a sex-role sense, they do demonstrate the acceptance of counter culture norms, at least on an ideological level, among these high school students.

The behavioral data, however, are completely different in character. Here the traditional sex roles were played out. The boys may have been ambivalent about fantasied success in medical school, but they objected to the notion that they were inferior to girls. Those boys given low standings were frankly incredulous and several suggested that the experimenter had confused their scores with those of their female partner. When the low boys were assured that the scores were indeed correct, they worked hard to disprove their incompetence. The result for a number was an increase in score by several points, a change which is rather hard to produce. The low-scoring girls invariably accepted the reports of their inferior performance; few increased their scores. In contrast,

the high girls, despite the fact that many showed no evidence of fear of success on the projective test, either lowered their performance level sufficiently to drop below the boy or showed evidence that their superior performance generated considerable tension.

The results of the study point to the necessity for further research on male-female interactions. They also demonstrate the need for the inclusion in research on achievement motivation of elements which would permit the study of ambivalence about the outcome of striving among both men and women.

The social need for research into both of these areas is considerable. Women who accept the new freedom for striving will find it difficult to achieve their goals if they are unable to assert themselves day in and day out in interactions with men. And men who are ambivalent about the goals of the establishment may still respond reflexly by striving in a great many situations, but are likely to find it hard to develop a secure sense of direction. Lastly, if men cannot accept women as their equals or superiors in some accomplishments, and if women cannot unselfconsciously excel, the relations between men and women will continue to be greatly troubled.

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Table 1

Hidden Figures Test Scores for 56 High School Students on Pretest and in a Social Situation (Experiment)

	N	Pretest		Experiment		Regressed Scores	
		$\bar{X}$	s	$\bar{X}$	s	$\bar{X}$	s
High Male	14	7.5	1.8	5.8	2.3	1.07	4.01
Low Male	14	1.5	0.7	4.4	2.9	0.82	3.10
High Female	14	8.3	2.7	4.2	2.5	-0.65	2.43
Low Female	14	2.9	1.2	2.9	1.9	-1.01	3.79

Table 2

Summary of Two-way Analysis of Variance, Regressed Scores, Hidden Figures Test, for 56 High School Students

Source	ss	df	Ms	F
Rows (sex)	44.4645	1	44.4645	7.666*
Columns (initial HFT score)	1.2902	1	1.2902	0.222
Interaction	0.0491	1	0.0491	0.008
Error (within cells)	301.6118	52	5.8000	- -
Totals	347.4156	55	- -	- -

*p <.01